```
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FILE COVERS 1907 - 3 Oct 2002  VOL 137 ISS 14
FILE LAST UPDATED: 2 Oct 2002  (20021002/ED)

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=> D QUE L30
L23          663 SEA FILE=HCAPLUS ABB=ON  (DEVICE? OR APPARATUS?) AND PLASMA(3A)
                DETECT?
L24         9763 SEA FILE=HCAPLUS ABB=ON  (UPPER? OR TOP OR ABOVE)(3A)ELECTROD?

L25            6 SEA FILE=HCAPLUS ABB=ON  L23 AND L24
L26            2 SEA FILE=HCAPLUS ABB=ON  L23 AND COOL?(2A)PLATE?
L27            0 SEA FILE=HCAPLUS ABB=ON  L23 AND ?HOLE?(2A)INCREAS?
L28            0 SEA FILE=HCAPLUS ABB=ON  L23 AND ?HOLE?(3A)(INCREAS? OR SIZE?)

L29            8 SEA FILE=HCAPLUS ABB=ON  L23 AND PRESSURE?(2A)DETECT?
L30           15 SEA FILE=HCAPLUS ABB=ON  (L25 OR L26 OR L27 OR L28 OR L29)


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FILE LAST UPDATED: 01 OCT 2002            <20021001/UP>
MOST RECENT DERWENT UPDATE          200263   <200263/DW>
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>>> SLART (Simultaneous Left and Right Truncation) is now
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    /BIX is also provided which comprises both /BI and /ABEX <<<

>>> The BATCH option for structure searches has been
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    GUIDES, PLEASE VISIT:
    http://www.derwent.com/userguides/dwpi_guide.html <<<

=> D QUE L32
L23         663 SEA FILE=HCAPLUS ABB=ON  (DEVICE? OR APPARATUS?) AND PLASMA(3A)
                DETECT?
L24        9763 SEA FILE=HCAPLUS ABB=ON  (UPPER? OR TOP OR ABOVE)(3A)ELECTROD?

L25           6 SEA FILE=HCAPLUS ABB=ON  L23 AND L24
L26           2 SEA FILE=HCAPLUS ABB=ON  L23 AND COOL?(2A)PLATE?
L27           0 SEA FILE=HCAPLUS ABB=ON  L23 AND ?HOLE?(2A)INCREAS?
L28           0 SEA FILE=HCAPLUS ABB=ON  L23 AND ?HOLE?(3A)(INCREAS? OR SIZE?)

L29           8 SEA FILE=HCAPLUS ABB=ON  L23 AND PRESSURE?(2A)DETECT?
L31          17 SEA FILE=WPIX ABB=ON  (L25 OR L26 OR L27 OR L28 OR L29)
L32          11 SEA FILE=WPIX ABB=ON  L31 AND H01L?/IC


=> FILE JAPIO
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FILE LAST UPDATED: 11 SEP 2002      <20020911/UP>
FILE COVERS APR 1973 TO MAY 31, 2002

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    will no longer be valid.  SEE HELP RLO for details  <<<


=> D QUE L35
L23         663 SEA FILE=HCAPLUS ABB=ON  (DEVICE? OR APPARATUS?) AND PLASMA(3A)
                DETECT?
L24        9763 SEA FILE=HCAPLUS ABB=ON  (UPPER? OR TOP OR ABOVE)(3A)ELECTROD?

L25           6 SEA FILE=HCAPLUS ABB=ON  L23 AND L24
L26           2 SEA FILE=HCAPLUS ABB=ON  L23 AND COOL?(2A)PLATE?
L27           0 SEA FILE=HCAPLUS ABB=ON  L23 AND ?HOLE?(2A)INCREAS?
L28           0 SEA FILE=HCAPLUS ABB=ON  L23 AND ?HOLE?(3A)(INCREAS? OR SIZE?)

L29           8 SEA FILE=HCAPLUS ABB=ON  L23 AND PRESSURE?(2A)DETECT?
L34          22 SEA FILE=JAPIO ABB=ON  (L25 OR L26 OR L27 OR L28 OR L29)
L35          15 SEA FILE=JAPIO ABB=ON  L34 AND H01L?/IC


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FILE COVERS 1985 TO 24 SEP 2002 (20020924/ED)

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=> D QUE L36
L23          663 SEA FILE=HCAPLUS ABB=ON  (DEVICE? OR APPARATUS?) AND PLASMA(3A)
                 DETECT?
L24         9763 SEA FILE=HCAPLUS ABB=ON  (UPPER? OR TOP OR ABOVE)(3A)ELECTROD?

L25            6 SEA FILE=HCAPLUS ABB=ON  L23 AND L24
L26            2 SEA FILE=HCAPLUS ABB=ON  L23 AND COOL?(2A)PLATE?
L27            0 SEA FILE=HCAPLUS ABB=ON  L23 AND ?HOLE?(2A)INCREAS?
L28            0 SEA FILE=HCAPLUS ABB=ON  L23 AND ?HOLE?(3A)(INCREAS? OR SIZE?)

L29            8 SEA FILE=HCAPLUS ABB=ON  L23 AND PRESSURE?(2A)DETECT?
L36            0 SEA FILE=JICST-EPLUS ABB=ON  (L25 OR L26 OR L27 OR L28 OR L29)


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=> D QUE L37
L23          663 SEA FILE=HCAPLUS ABB=ON  (DEVICE? OR APPARATUS?) AND PLASMA(3A)
                 DETECT?
L24         9763 SEA FILE=HCAPLUS ABB=ON  (UPPER? OR TOP OR ABOVE)(3A)ELECTROD?

L25            6 SEA FILE=HCAPLUS ABB=ON  L23 AND L24
L26            2 SEA FILE=HCAPLUS ABB=ON  L23 AND COOL?(2A)PLATE?
L27            0 SEA FILE=HCAPLUS ABB=ON  L23 AND ?HOLE?(2A)INCREAS?
L28            0 SEA FILE=HCAPLUS ABB=ON  L23 AND ?HOLE?(3A)(INCREAS? OR SIZE?)

L29            8 SEA FILE=HCAPLUS ABB=ON  L23 AND PRESSURE?(2A)DETECT?
L37            0 SEA FILE=NTIS ABB=ON  (L25 OR L26 OR L27 OR L28 OR L29)

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FILE COVERS 1969 TO DATE.

=> D QUE L38
L23          663 SEA FILE=HCAPLUS ABB=ON  (DEVICE? OR APPARATUS?) AND PLASMA(3A)
                 DETECT?
L24         9763 SEA FILE=HCAPLUS ABB=ON  (UPPER? OR TOP OR ABOVE)(3A)ELECTROD?

L25            6 SEA FILE=HCAPLUS ABB=ON  L23 AND L24
L26            2 SEA FILE=HCAPLUS ABB=ON  L23 AND COOL?(2A)PLATE?
L27            0 SEA FILE=HCAPLUS ABB=ON  L23 AND ?HOLE?(2A)INCREAS?
L28            0 SEA FILE=HCAPLUS ABB=ON  L23 AND ?HOLE?(3A)(INCREAS? OR SIZE?)
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L29           8 SEA FILE=HCAPLUS ABB=ON  L23 AND PRESSURE?(2A)DETECT?
L38           2 SEA FILE=INSPEC ABB=ON  (L25 OR L26 OR L27 OR L28 OR L29)
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FILE COVERS 1970 TO DATE.


=> D QUE L39
L23         663 SEA FILE=HCAPLUS ABB=ON  (DEVICE? OR APPARATUS?) AND PLASMA(3A)
                DETECT?
L24        9763 SEA FILE=HCAPLUS ABB=ON  (UPPER? OR TOP OR ABOVE)(3A)ELECTROD?

L25           6 SEA FILE=HCAPLUS ABB=ON  L23 AND L24
L26           2 SEA FILE=HCAPLUS ABB=ON  L23 AND COOL?(2A)PLATE?
L27           0 SEA FILE=HCAPLUS ABB=ON  L23 AND ?HOLE?(2A)INCREAS?
L28           0 SEA FILE=HCAPLUS ABB=ON  L23 AND ?HOLE?(3A)(INCREAS? OR SIZE?)

L29           8 SEA FILE=HCAPLUS ABB=ON  L23 AND PRESSURE?(2A)DETECT?
L39           0 SEA FILE=COMPENDEX ABB=ON  (L25 OR L26 OR L27 OR L28 OR L29)


=>   D QUE L47
L40         181 SEA FILE=COMPENDEX ABB=ON  (DEVICE? OR APPARATUS?) AND
                PLASMA(3A)DETECT?
L41          45 SEA FILE=COMPENDEX ABB=ON  L40 AND SEMICONDUCT?
L42          21 SEA FILE=COMPENDEX ABB=ON  L41 AND (MANUF? OR PRODUC?)
L43           0 SEA FILE=COMPENDEX ABB=ON  L42 AND PRESSURE
L44           2 SEA FILE=COMPENDEX ABB=ON  L42 AND ELECTROD?
L45       22050 SEA FILE=COMPENDEX ABB=ON  SEMICONDUCTOR DEVICE MANUFACTURE+NT/
                CT
L46           7 SEA FILE=COMPENDEX ABB=ON  L45 AND PLASMA(2A)DETECT?
L47           9 SEA FILE=COMPENDEX ABB=ON  L43 OR L44 OR L46

=> FILE EMA
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FILE COVERS 1986 TO DATE.

=> D QUE L48
L23         663 SEA FILE=HCAPLUS ABB=ON  (DEVICE? OR APPARATUS?) AND PLASMA(3A)
                DETECT?
L24        9763 SEA FILE=HCAPLUS ABB=ON  (UPPER? OR TOP OR ABOVE)(3A)ELECTROD?

L25           6 SEA FILE=HCAPLUS ABB=ON  L23 AND L24
L26           2 SEA FILE=HCAPLUS ABB=ON  L23 AND COOL?(2A)PLATE?
L27           0 SEA FILE=HCAPLUS ABB=ON  L23 AND ?HOLE?(2A)INCREAS?
L28           0 SEA FILE=HCAPLUS ABB=ON  L23 AND ?HOLE?(3A)(INCREAS? OR SIZE?)

L29           8 SEA FILE=HCAPLUS ABB=ON  L23 AND PRESSURE?(2A)DETECT?
L48           0 SEA FILE=EMA ABB=ON  (L25 OR L26 OR L27 OR L28 OR L29)
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=> DUP REM L30 L32 L35 L38 L47
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PROCESSING COMPLETED FOR L32
PROCESSING COMPLETED FOR L35
PROCESSING COMPLETED FOR L38
PROCESSING COMPLETED FOR L47
L49          50 DUP REM L30 L32 L35 L38 L47 (2 DUPLICATES REMOVED)

=> D K49 ALL 1-50
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=> D L49 ALL 1-50

L49  ANSWER 1 OF 50  HCAPLUS  COPYRIGHT 2002 ACS       DUPLICATE 1
AN   2002:107766  HCAPLUS
DN   136:160068
TI   Plasma etching apparatus with cooling-plate
     electrode with gas-supply holes
IN   Sawayama, Takayoshi
PA   Japan
SO   U.S. Pat. Appl. Publ., 8 pp.
     CODEN: USXXCO
DT   Patent
LA   English
IC   ICM  H01L021-3065
NCL  156345000
CC   76-11 (Electric Phenomena)
FAN.CNT 1
     PATENT NO.        KIND  DATE          APPLICATION NO.  DATE
     ---------------   ----  --------      ---------------  --------
PI   US 2002014308      A1   20020207      US 2001-754277   20010105
     JP 2002043276      A2   20020208      JP 2000-225686   20000726
PRAI JP 2000-225686     A    20000726
AB   A problem arose in that when gas holes defined in a gas-introducing plate
```

applicant

lying within a plasma etching **app**. reached more than a given size, plasma entered from an etching-processing chamber to the backside (**cooling plate** side) of a gas-introducing plate through the gas holes. In order to solve such a problem, there is provided an **upper electrode** which comprises a **cooling plate** having a plurality of gas supply holes for supplying gas, a gas-introducing plate having gas holes for introducing the gas into a semiconductor wafer uniformly, a jig for fixing the gas-introducing **plate** to the **cooling plate**, and a sensor for **detecting plasma**.

ST plasma etching **app cooling plate** gas supply electrode

IT Semiconductor **device** fabrication
(**app.**; plasma etching **app.** with **cooling-plate** electrode with gas-supply holes)

IT Cooling **apparatus**
Electrodes
Jigs
Plates
(plasma etching **app.** with **cooling-plate** electrode with gas-supply holes)

IT Etching **apparatus**
Sensors
(plasma; plasma etching **app.** with **cooling-plate** electrode with gas-supply holes)

L49 ANSWER 2 OF 50 HCAPLUS COPYRIGHT 2002 ACS
AN 2002:428464 HCAPLUS
TI Dry etching **device**. [Machine Translation].
IN Tsutaeda, Atsushi
PA Seiko Epson Corp., Japan
SO Jpn. Kokai Tokkyo Koho, 4 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01L021-3065
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2002164321	A2	20020607	JP 2000-359877	20001127

AB [Machine Translation of Descriptors]. The dry etching **device** of the high reliability which compared to accurately monitoring it is possible the information which is effective to actually plasma etching process is offered. Chamber 10, the lower part electrode has 11 which mounts semiconductor wafer WF and **upper electrode** 12. **Upper electrode** section 12 forms the gas supply head which is made to introduce into the plasma directly with the etching gas as a shower condition. As for lower part and **upper electrode** section 11,12 RF electric power is impressed as the respective cathode and an anode (ground electric potential), the etching gas EG which is introduced becomes plasma etching gas PEG. At least, in order to obtain the information of plasma electric current, plural sensor sections 15 the respective specified distance alienating from around lower part electrode section, 11 it is provided. In addition, arithmetic logical unit 16 compares calculates the current value which is **detected** during **plasma** etching from sensor section 15 each one.

L49 ANSWER 3 OF 50 HCAPLUS COPYRIGHT 2002 ACS
AN 2002:155183 HCAPLUS

DN 136:192066
TI Detection of end point of cleaning of plasma CVD **apparatus**, and plasma CVD **apparatus**
IN Tsukamoto, Takeshi
PA Sharp Corp., Japan
SO Jpn. Kokai Tokkyo Koho, 7 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01L021-205
ICS C23C016-44; H01L021-3065
CC 75-1 (Crystallography and Liquid Crystals)
Section cross-reference(s): 76
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2002064068	A2	20020228	JP 2001-145892	20010516
PRAI	JP 2000-171836	A	20000608		

AB The title method involves detg. the temporal pressure difference in a deposition chamber after the chamber pressure reaches a predetd. pressure and detg. the end point when the pressure difference becomes a certain value. A plasma CVD **app**. provided with a means of carrying out the above method is also described.
ST plasma CVD **app** cleaning end point detn
IT Cleaning
Pressure
(**detection** of end point of cleaning of plasma CVD **app**. by monitoring pressure difference, and plasma CVD **app.**)
IT Vapor deposition **apparatus**
(**plasma; detection** of end point of cleaning of plasma CVD **app.** by monitoring pressure difference, and plasma CVD **app.**)

L49 ANSWER 4 OF 50 WPIX (C) 2002 THOMSON DERWENT
AN 2002-531742 [57] WPIX
DNN N2002-421088
TI **Plasma** processing method involves **detecting** position of automatic pressure control valve when exhaust ports of vacuum vessel are closed.
DC U11 V05
PA (MATU) MATSUSHITA DENKI SANGYO KK
CYC 1
PI JP 2002113355 A 20020416 (200257)* 5p B01J019-08
ADT JP 2002113355 A JP 2000-305811 20001005
PRAI JP 2000-305811 20001005
IC ICM B01J019-08
ICS B01J003-02; **H01L021-3065**
AB JP2002113355 A UPAB: 20020906
NOVELTY - The position of automatic pressure control (APC) valve (10) is detected when the exhaust ports of a vacuum vessel are closed.
DETAILED DESCRIPTION - An INDEPENDENT CLAIM is included for plasma processing **apparatus**.
USE - For plasma processing the substrates.
ADVANTAGE - Malfunctioning of APC valve is easily detected by detecting position of APC valve at the time of closing exhaust ports.
DESCRIPTION OF DRAWING(S) - The figure shows a block diagram of automatic pressure adjustment **device**. (Drawing includes non-English language text).
APC Valve 10
Dwg.1/4

FS EPI
FA AB; GI
MC EPI: U11-C07A1; V05-F05C

L49 ANSWER 5 OF 50 HCAPLUS COPYRIGHT 2002 ACS DUPLICATE 2
AN 2001:469569 HCAPLUS
DN 135:85711
TI Dry etching **apparatus** and determination of etching end point
IN Mino, Yoshiko
PA Matsushita Electric Industrial Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 9 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01L021-3065
ICS C23F004-00; G01N021-71
CC 76-11 (Electric Phenomena)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2001176851	A2	20010629	JP 1999-355790	19991215

AB The title drys etching chamber holds an **upper electrode** , a lower **electrode** in an opposed position, a transparent substrate provided with an etching material on the lower electrode, and high-frequency power for generating plasma between the electrodes for etching of the material to be etched on the substrate. The title **app.** further comprises an optical waveguide tubes for transmission of the plasma light from via holes on the material/substrate/electrode, an optical **detector** for the **plasma** light, and high-frequency power ON/OFF-switch controlled by the optical detector at the etching end pt. The **app.** makes possible detecting etching end pt. and controlling the power switch by optical transmission for the plasma light.
ST **plasma** etching end pt **detection** switching power process control
IT Optical detectors
Optical transmission
Process control
(dry etching **app.** and detn. of etching end point)
IT Etching
(dry; dry etching **app.** and detn. of etching end point)
IT Semiconductor materials
Thermal insulators
(film, etching of, end pt. detection; dry etching **app.** and detn. of etching end point)
IT Electric switching
(for high-frequency power; dry etching **app.** and detn. of etching end point)
IT Optical waveguides
(tubes; dry etching **app.** and detn. of etching end point)
IT 7440-21-3, Silicon, properties
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(polycryst., etching of; dry etching **app.** and detn. of etching end point)
IT 1344-28-1, Aluminum oxide, properties 7631-86-9, Silica, properties 59763-75-6, Tantalum oxide 109371-84-8, Silicon nitride (SiO-1NO-1)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(transparent film, etching of; dry etching **app.** and detn. of

etching end point)

L49 ANSWER 6 OF 50 COMPENDEX COPYRIGHT 2002 EEI
AN 2001(44):1353 COMPENDEX
TI Morphological skeleton algorithm for PDP **production** line inspection.
AU Ge, R. (Systems Design Engineering University of Waterloo, Waterloo, Ont., N2L 3G1, Canada); Clausi, D.A.
MT Canadian Conference on Electrical and Computer Engineering.
MO GENNUM Corp.; Bell Simpatico Canada; IEEE Canada; General Electric Canada
ML Toronto, Ont., Canada
MD 13 May 2001-16 May 2001
SO Canadian Conference on Electrical and Computer Engineering v 2 2001.p 1117-1122, (IEEE cat n 01TH8555)
CODEN: CCCEFV ISSN: 0840-7789
PY 2001
MN 58526
DT Conference Article
TC Theoretical
LA English
AB Morphological skeletonization is an image processing technique that reduces complex, thick-lined images to a series of single pixel lines that accurately represent the original shapes. This procedure is especially useful to simplify automated applications requiring simple shape analysis and continuity checking by reducing the amount of redundant image data. In the **semiconductor** inspection field, skeletonization is a process that can be used to **detect** defects during **plasma** display panel (PDP) inspection. This paper will introduce a novel morphological skeletonization algorithm developed for **electrode** pattern inspection of PDPs. This algorithm has been successfully integrated within a commercial machine vision system. 4 Refs.
CC 723.2 Data Processing; 932.3 Plasma Physics; 723.5 Computer Applications; 741.2 Vision
CT *Image processing; Plasma display **devices**; Computer vision; Algorithms
ST Morphological skeleton algorithms

L49 ANSWER 7 OF 50 HCAPLUS COPYRIGHT 2002 ACS
AN 2000:599701 HCAPLUS
TI Laser analytical instrument. [Machine Translation].
IN Ashida, Takashi; [NAME NOT TRANSLATED]
PA Power Reactor and Nuclear Fuel Development Corp., Japan; Mitsubishi Heavy Industries, Ltd.
SO Jpn. Kokai Tokkyo Koho, 5 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM G01N021-63
ICS G01N021-00; G01N021-64; G01N029-00; B09B001-00
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2000235001	A2	20000829	JP 1999-35360	19990215

AB [Machine Translation of Descriptors]. Each tries to be able to analyze chemical kind analysis, the chemical form and element density et cetera at laser oscillation **device** 1, shortening in analysis time, the minimum conversion and space-saving of the sample quantity assures. When the tò plasma converting the sample solution with the 1st detector and the laser irradiation which **detect** the **pressure** wave inside the sample solution cell which occurs due to the plural sample

solution cells and the laser irradiation where the laser radiation from the laser oscillation **device** and the laser oscillation **d vice** is irradiated, it is something which tries to be able to do the analysis which the 3rd detector which detects the fluorescence which occurs with the 2nd **detector** which **detects** **plasma** light and due to the laser irradiation has, differs with the laser radiation which radiation is done, depending upon the 1st, 2nd and 3rd detector from the identical laser oscillation **device.**

L49 ANSWER 8 OF 50 HCAPLUS COPYRIGHT 2002 ACS
AN 2000:33222 HCAPLUS
TI Pressure adjustment change method and **device** of vacuum chamber. [Machine Translation].
IN Mitsumoto, Yutaka
PA Matsushita Electric Industrial Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 4 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H05H001-00
ICS H05H001-46
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2000012281	A2	20000114	JP 1998-172955	19980619

AB [Machine Translation of Descriptors]. Receiving the **detection** limited nearby **pressure** directive value of the **pressure** **detector,** stabilizing, try to be able cause the plasma discharge. The **pressure detector** the conductance valve receiving the directive value of pressure of 3 which modifies the exhaust quality inside 2 which degree of vacuum within vacuum chamber 1 the measurement method is done and vacuum chamber 1 and specification, feeding back the pressure from of **pressure detection** vessel, 2 adjusted conductance valve 3, the disregard doing function and the feedback which maintain within vacuum chamber 1 at pressure of directive value, whether or not the pressure regulator the **plasma detector** from the signal from of 10 which detects the occurrence of 4 which holds the function which locks the opening of conductance valve 3 and the **plasma** and **plasma detector** 10 the **plasma** occurred within vacuum chamber 1, judgement Has the judgement vessel 11 which does, when judges, that judgement vessel 11 does not occur, the plasma, when judges that it makes conductance valve 3 fixed, occurs feeds back in pressure regulator 4.

L49 ANSWER 9 OF 50 WPIX (C) 2002 THOMSON DERWENT
AN 2000-610506 [58] WPIX
DNN N2000-452020 DNC C2000-182517
TI Method of real-time **detecting** gas leakage in **plasma** etching chamber through monitoring base-pressure applicable in a dry etching process to increase the yield of the production.
DC L03 U11 X24
IN CHU, B T; JUO, J W; PENG, Y -; YOU, M
PA (TASE-N) TAIWAN SEMICONDUCTOR MFG CO LTD
CYC 1
PI TW 386260 A 20000401 (200058)* 22p H01L021-3065 <--
ADT TW 386260 A TW 1998-108121 19980526
PRAI TW 1998-108121 19980526
IC ICM **H01L021-3065**
AB TW 386260 A UPAB: 20001114
NOVELTY - Process comprises: (1) transferring a wafer to the machine using

a robot arm; (2) separately setting the flow rate of a pseudo gas and a gap to a predetermined value, in which the pseudo gas is not a real gas, and the gap is the distance between the **upper electrode** in the etching reaction chamber and the surface of the wafer; (3) measuring the present base-pressure in the etching reaction chamber in which the present base-pressure of the etching reaction chamber is measured by a flow manometer; (4) obtaining a differential value between the present base-pressure of the etching reaction chamber and the normal base-pressure of the etching reaction chamber, in which the normal base-pressure of the etching reaction chamber is measured by the flow manometer when the gas in the etching reaction chamber is completely evacuated; and (5) terminating the etching process and activating an alarm **device** when the above-mentioned differential value exceeds a preset error value.
Dwg.1/5

FS CPI EPI
FA AB; GI
MC CPI: L04-C07B; L04-C18
EPI: U11-C07A1; X24-D05

L49 ANSWER 10 OF 50 HCAPLUS COPYRIGHT 2002 ACS
AN 2000:670676 HCAPLUS
DN 133:275678
TI An atmospheric pressure plasma on a chip applied as a molecular emission detector in gas chromatography
AU Eijkel, Jan C. T.; Stoeri, Herbert; Manz, Andreas
CS Zeneca/SmithKline Beecham Centre for Analytical Sciences, Imperial College, London, SW7 2AY, UK
SO Micro Total Analysis Systems 2000, Proceedings of the .mu.TAS Symposium, 4th, Enschede, Netherlands, May 14-18, 2000 (2000), 591-594. Editor(s): Van den Berg, Albert; Olthuis, W.; Bergveld, Piet. Publisher: Kluwer Academic Publishers, Dordrecht, Neth.
CODEN: 69AJPB
DT Conference
LA English
CC 80-2 (Organic Analytical Chemistry)
AB A micromachined plasma chip was developed. To study its performance as an optical emission detector it is coupled to a conventional gas chromatograph (GC). In the plasma chamber of 180 nL vol. a d.c. glow discharge is generated at 770 V and 12 .mu.A (power 9 mW) in 1.2 atm helium. Carbon-contg. compds. are detected by recording the emission of CO at 519 nm. For hexane the detector has a linear dynamic range of over two decades and a min. detectability of 10-12 g/s (800 ppb). The **device** was operated for >24 h without a significant change in performance. Operation is stable and instrumental requirements are simple. The detector chip is designed for on-chip integration with a GC. A simple scaling theory is presented, showing that the **device** is at least as sensitive as a thermal cond. detector at the vol. flow rates of interest.
ST atm pressure **plasma** chip mol emission **detector** gas chromatog
IT Gas chromatographic **detectors**
Glow discharge sources
Optical **detectors**
(an atm. **pressure plasma** on a chip applied as a mol. emission detector in gas chromatog.)
IT 110-54-3, Hexane, analysis
RL: ANT (Analyte); ANST (Analytical study)
(analyte; an atm. pressure plasma on a chip applied as a mol. emission detector in gas chromatog.)

IT 7440-57-5, Gold, analysis
RL: ARU (Analytical role, unclassified); DEV (Device component use); ANST (Analytical study); USES (Uses)
(micromachined glow discharge electrode; an atm. pressure plasma on a chip applied as a mol. emission detector in gas chromatog.)
RE.CNT 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
(1) Annino, R; Process gas chromatography, fundamentals and applications 1992
(2) Eijkel, J; Anal Chem 1999, V71, P2600 HCAPLUS
(3) Engel, U; Anal Chem 2000, V72, P193 HCAPLUS
(4) Raizer, Y; Gas discharge physics 1991
(5) Terry, S; IEEE Trans on Electron Dev 1979, VED-26, P1880 HCAPLUS
(6) Zimmermann, S; Micro Total Analysis Systems 1998, P471

L49 ANSWER 11 OF 50 COMPENDEX COPYRIGHT 2002 EEI
AN 2000(44):527 COMPENDEX
TI Fault **detection** of **plasma** etchers using optical emission spectra.
AU Yue, H.Henry (Tokyo Electron America, Inc, Austin, TX, USA); Qin, S.Joe; Markle, Richard J.; Nauert, Chris; Gatto, Michael
SO IEEE Transactions on Semiconductor Manufacturing v 13 n 3 Aug 2000. p 374-385
CODEN: ITSMED ISSN: 0894-6507
PY 2000
DT Journal
TC Application; Theoretical; Experimental
LA English
AB The objective of this paper is to investigate the suitability of using optical emission spectroscopy (OES) for the fault detection and classification of plasma etchers. The OES sensor system used in this study can collect spectra at up to 512 different wavelengths.Multiple scans of the spectra are taken from a wafer, and the spectra data are available for multiple wafers. As a result, the amount of the OES data is typically large. This poses a difficulty in extracting relevant information for fault detection and classification. In this paper, we propose the use of multiway principal component analysis (PCA) to analyze the sensitivity of the multiple scans within a wafer with respect to typical faults such as etch stop, which is a fault that occurs when the polymer deposition rate is larger than the etch rate. Several PCA-based schemes are tested for the purpose of fault detection and wavelength selection.A sphere criterion is proposed for wavelength selection and compared with an existing method in the literature. To construct the final monitoring model, the OES data of selected wavelengths are properly scaled to calculate fault detection indices. Reduction in the number of wavelengths implies reduced cost for implementing the fault detection system. All experiments are conducted on an Applied Materials 5300 oxide etcher at Advanced Micro Devices (AMD) in Austin, TX.(Author abstract) 23 Refs.
CC 714.2 Semiconductor Devices and Integrated Circuits; 802.2 Chemical Reactions; 741.3 Optical Devices and Systems; 922.2 Mathematical Statistics; 921.6 Numerical Methods; 722.2 Computer Peripheral Equipment
CT ***Semiconductor device manufacture**; Computer software; Spectrometers; Failure analysis; Statistical methods; Sensitivity analysis; Silicon wafers; User interfaces; Plasma etching; Emission spectroscopy
ST Plasma etchers; Optical emission spectra; Principal component analysis

L49 ANSWER 12 OF 50 COMPENDEX COPYRIGHT 2002 EEI
AN 2000(22):1715 COMPENDEX
TI Dry-etch fabrication of reduced area InGaAs/InP DHBT devices for high speed circuit applications.

AU Kopf, R.F. (Lucent Technologies, Murray Hill, NJ, USA); Hamm, R.A.; Wang, Y.-C.; Ryan, R.W.; Tate, A.; Melendes, M.A.; Pullela, R.; Chen, Y.-K.; Thevin, J.
SO Journal of Electronic Materials v 29 n 2 2000.p 222-224
CODEN: JECMA5 ISSN: 0361-5235
PY 2000
DT Journal
TC Application; Experimental
LA English
AB We have fabricated reduced area InGaAs/InP DHBTs for high speed circuit applications.To produce the small dimensions required, a process involving both wet chemical and ECR plasma etching was developed.Optical emission spectroscopy was used for end-point **detection** during **plasma** etching.With this improved process, an ft of 170 and fmax of 200 GHz were achieved for 1.2 multiplied by 3 mu m2 emitter size devices with a 500 angstroms base.(Author abstract) 13 Refs.
CC 714.2 Semiconductor Devices and Integrated Circuits; 712.1.2 Compound Semiconducting Materials; 802.2 Chemical Reactions; 932.3 Plasma Physics; 931.3 Atomic and Molecular Physics; 741.1 Light. Optics
CT *Heterojunction bipolar transistors; Semiconducting indium phosphide; **Semiconductor device manufacture**; Electron cyclotron resonance; Emission spectroscopy; Plasma etching
ST Double heterojunction bipolar transistors (DHBT)
ET As*Ga*In; As sy 3; sy 3; Ga sy 3; In sy 3; InGaAs; In cp; cp; Ga cp; As cp; In*P; InP; P cp

L49 ANSWER 13 OF 50 HCAPLUS COPYRIGHT 2002 ACS
AN 1999:556965 HCAPLUS
DN 131:192957
TI Film deposition **apparatus** having detector of water partial pressure and manufacture of dielectric film using it
IN Fujibayashi, Katsura; Nakagawara, Osamu; Tanaka, Shinji; Yamada, Hajime
PA Murata Mfg. Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 5 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM C23C014-34
ICS C23C014-54; H01L021-203; H01L021-31
CC 76-10 (Electric Phenomena)
Section cross-reference(s): 75
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 11236666	A2	19990831	JP 1998-43781	19980225

AB The **app.** has (A) a vacuum chamber contg. a target electrode, a substrate facing to the electrode, and a target placed on the electrode, (B) an elec. power source for application of voltage to the electrode, (C) an inlet and outlet for introduction and evacuation of sputtering gas, and (D) a detector of H2O partial pressure in the chamber. The dielec. film is manufd. by using the above **app.** under monitoring H2O partial pressure to keep const. The **app.** gives dielec. films with uniform dielec. const.
ST sputter deposition dielec film **app**; water partial pressure control dielec film sputtering; perovskite dielec film magnetron sputtering; **detector** water partial **pressure** sputtering **app**
IT Plasma emission spectrometry
(for water content detection; sputter deposition **app.** having detector of water partial pressure for manuf. of dielec. film with

uniform dielec. const.)
IT Emission spectrometers
(**plasma**, for **detection** of water content; sputter deposition **app**. having detector of water partial pressure for manuf. of dielec. film with uniform dielec. const.)
IT Electric insulators
Magnetron sputtering
Magnetron sputtering **apparatus**
Perovskite-type crystals
(sputter deposition **app**. having detector of water partial pressure for manuf. of dielec. film with uniform dielec. const.)
IT 7732-18-5, Water, uses
RL: NUU (Other use, unclassified); USES (Uses)
(partial pressure-controlled; sputter deposition **app**. having detector of water partial pressure for manuf. of dielec. film with uniform dielec. const.)

L49 ANSWER 14 OF 50 HCAPLUS COPYRIGHT 2002 ACS
AN 1999:156110 HCAPLUS
DN 130:171561
TI Low-pressure plasma etching method and **apparatus**
IN Harano, Hideki
PA NEC Corp., Japan
SO Jpn. Kokai Tokkyo Koho, 9 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM C23F004-00
ICS H01L021-3065; H05H001-46
CC 56-6 (Nonferrous Metals and Alloys)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 11061456	A2	19990305	JP 1997-229008	19970826

AB Plasma is ignited under a pressure higher than that required for etching a substrate, and then pressure is adjusted in response to the signal from a discharge detector, e.g., an emission spectrometer or illuminometer.
ST **plasma** etching **pressure** discharge **detector**
emission spectrometer illuminometer
IT Pressure
(control; in low-pressure plasma etching method and **app.**)
IT Emission spectrometers
(in low-pressure plasma etching method and **app.**)
IT Illumination
(meter; in low-pressure plasma etching method and **app.**)
IT Etching
(plasma; low-pressure plasma etching method and **app.**)

L49 ANSWER 15 OF 50 WPIX (C) 2002 THOMSON DERWENT
AN 1999-293938 [25] WPIX
DNN N1999-220515 DNC C1999-086697
TI Etching **apparatus** for use in manufacture of semiconductor **device** - includes gas **pressure detector** to **detect** fluctuation of gas pressure generated at time of **plasma** etching, to **detect** etching completion.
DC L03 U11 V05 X14
PA (SHBE) SHIBAURA SEISAKUSHO KK
CYC 1
PI JP 11097420 A 19990409 (199925)* 5p H01L021-3065 <--
ADT JP 11097420 A JP 1997-254797 19970919

PRAI JP 1997-254797 19970919
IC ICM **H01L021-3065**
ICS C23F004-00
AB JP 11097420 A UPAB: 19990707
NOVELTY - In the etching chamber (2), target object is etched by **plasma** gas. Gas **pressure detector** (5) **detects** the fluctuation of gas pressure generated at the time of etching by plasma discharge and determines etching end point.
USE - For manufacture of semiconductor **device.**
ADVANTAGE - High precision detection of etching end point.
DESCRIPTION OF DRAWING - The figure shows the etching **apparatus.** (2) Etching chamber; (5) Gas **pressure detector.**
Dwg.1/3
FS CPI EPI
FA AB; GI
MC CPI: L04-C07D
EPI: U11-C07A1; U11-C09C; U11-F01B1; V05-F04H; V05-F05C; V05-F05E5A; V05-F08E1; X14-F02

L49 ANSWER 16 OF 50 JAPIO COPYRIGHT 2002 JPO
AN 1999-340452 JAPIO
TI SEMICONDUCTOR **DEVICE**
IN SAKAI HISASHI
PA KYOCERA CORP
PI JP 11340452 A 19991210 Heisei
AI JP 1998-149389 (JP10149389 Heisei) 19980529
PRAI JP 1998-149389 19980529
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1999
IC ICM **H01L029-778**
ICS **H01L021-338; H01L029-812**
AB PROBLEM TO BE SOLVED: To realize high definition and high speed by providing an insulating film on the opposite side wall parts of two insular semiconductor layers and forming a gate **electrode** from **above** the insulating film to above semiconductor layer.
SOLUTION: A source region and a drain region of insular semiconductor layer are formed by etching an SiO<SB>2</SB> film 6 and an n<SP>+</SP>-GaAs layer 5. An SiO<SB>2</SB> film 7 is then formed by removing resist. Subsequently, the SiO<SB>2</SB> film 7 is removed from the gate part and the source-drain part by anisotropic etching and the SiO<SB>2</SB> film 7 is formed only on the side wall part of the insular semiconductor layer at the source-drain part. Thereafter, corner part is removed by etching the side wall SiO<SB>2</SB> film 7 while turning a substrate 1 thus removing surface **detects** due to **plasma** damage. At or Au/Pt/Ti for forming a gate electrode 8 is deposited thereon and a T-shaped Al gate electrode 8 is formed after patterning a gate resist 12 thus realizing high speed and high efficiency.
COPYRIGHT: (C)1999,JPO

L49 ANSWER 17 OF 50 JAPIO COPYRIGHT 2002 JPO
AN 1999-149994 JAPIO
TI PLASMA TREATING METHOD
IN ISHIHARA HIROYUKI; KAWAMURA GOHEI
PA TOKYO ELECTRON YAMANASHI LTD
JAPAN SCIENCE & TECHNOLOGY CORP
PI JP 11149994 A 19990602 Heisei
AI JP 1998-223687 (JP10223687 Heisei) 19980723
PRAI JP 1997-223122 19970804
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1999
IC ICM H05H001-00

ICS C23F004-00; **H01L021-3065**; H05H001-46
AB PROBLEM TO BE SOLVED: To provide a plasma treating method capable of quickly, correctly detecting the end point of plasma treatment.
SOLUTION: A scepter 108 on which a wafer W is placed and an **upper electrode** 110 are faced within a treating chamber 102 in a etching **device** 100. High frequency power is applied to between the **upper electrode** 110 and the susceptor 8 to excite plasma P within the treating chamber 102. Plasma beams of the **plasma** P are **detected** with a light receiving part 148 through a detecting window 130, and data is sampled. In an arithmetic and control unit 146, the sampling data is fit based on a Weibull distribution function, then a differential value is found. The end point of etching treatment is detected from the wave form of the fitting data and that of the differential value.
COPYRIGHT: (C)1999,JPO

L49 ANSWER 18 OF 50 JAPIO COPYRIGHT 2002 JPO
AN 1998-074734 JAPIO
TI PLASMA TREATING **DEVICE** AND MANUFACTURE OF SEMICONDUCTOR **DEVICE**
IN TOMIOKA KAZUHIRO
PA TOSHIBA CORP
PI JP 10074734 A 19980317 Heisei
AI JP 1996-232084 (JP08232084 Heisei) 19960902
PRAI JP 1996-232084 19960902
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1998
IC ICM **H01L021-3065**
ICS C23C016-50; C23F004-00; **H01L021-205**; H05H001-46
AB PROBLEM TO BE SOLVED: To make it possible to monitor accurately abnormal discharge in a container and to contrive to enhance the yield of the manufacture of a semiconductor **device**.
SOLUTION: In a method of manufacturing a semiconductor **device** having the structure which a plasma using discharge is produced between a cathode electrode 13 which is installed in a plasma treating container 11, and the **upper** wall part (opposed **electrode**) of the container 11 and an etching treatment is performed to a substrate 12 to be treated which is placed on the electrode 13, utilizing this plasma, a reflected wave due to a change in the impedance of the **plasma** is **detected** by a directional coupler 15 and a wave detector 17 to monitor abnormal discharge and at the time when there is abnormal discharge is decided by this monitored result, a processing process for recovering damage which is accompanied by the abnormal discharge, to the substrate 12 is performed to the substrate 12.
COPYRIGHT: (C)1998,JPO

L49 ANSWER 19 OF 50 COMPENDEX COPYRIGHT 2002 EEI
AN 1998(33):5360 COMPENDEX
TI Plasma etching of submicron devices: In situ monitoring and control by multi-wavelength ellipsometry.
AU Maynard, H.L. (Lucent Technologies, Murray Hill, NJ, USA); Layadi, N.; Lee, J.T.C.
MT Proceedings of the 1997 2nd International Conference on Spectroscopic Ellipsometry.
ML Charleston, SC, USA
MD 12 May 1997-15 May 1997
SO Thin Solid Films v 313-314 n 1-2 Feb 1998.p 398-405
CODEN: THSFAP ISSN: 0040-6090
PY 1998
MN 48519
DT Journal

TC Theoretical; Experimental
LA English
AB We show that the use of in situ multi-wavelength ellipsometry allows endpoint **detection** during the **plasma** etching of submicron devices in a high-density plasma reactor.In addition, a quantitative model is presented to understand the ellipsometry traces obtained while etching patterned wafers.It allows one to determine the thickness of a film in real-time as it is etched. Knowing the thickness in real-time allows greater process control, as it enables one to stop or change the process at a specified remaining film thickness.This is extremely useful in the context of device fabrication, since processing conditions can be adjusted in real-time.(Author abstract) 8 Refs.
CC 712.1 Semiconducting Materials; 714.2 Semiconductor Devices and Integrated Circuits; 802.2 Chemical Reactions; 932.3 Plasma Physics; 731 Automatic Control Principles and Applications; 943.2 Mechanical Variables Measurements
CT *Semiconducting films; Plasma etching; Process control; **Semiconductor device manufacture**; Semiconductor device models; Thickness measurement; Ellipsometry; Thin films; ULSI circuits
ST Multi wavelength ellipsometry
ET In

L49 ANSWER 20 OF 50 HCAPLUS COPYRIGHT 2002 ACS
AN 1997:732015 HCAPLUS
DN 128:42657
TI Method of **detecting plasma** etching end point
IN Adachi, Noriyuki
PA Toshiba Corp., Japan
SO Jpn. Kokai Tokkyo Koho, 4 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01L021-31
ICS C23F004-00; H01L021-205; H01L021-3065
CC 76-11 (Electric Phenomena)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 09293710	A2	19971111	JP 1996-105673	19960425

AB The process **detects** a **pressure** change between the initial pressure (when an etching discharge begins) and a predetd. pressure in a CVD chamber. The process is not affected by a zero point drift of a pressure gauge, so that an accurate end point detn. can be carried out.
ST **plasma** etching end point **detection**
IT Etching
(**plasma; detection** of **plasma** etching end point in CVD **app.** by pressure change)

L49 ANSWER 21 OF 50 JAPIO COPYRIGHT 2002 JPO
AN 1997-219396 JAPIO
TI METHOD FOR DETECTING REACTION IN MANUFACTURING **APPARATUS** OF SEMICONDUCTOR
IN ANDO ATSUHIRO
PA SONY CORP
PI JP 09219396 A 19970819 Heisei
AI JP 1996-48276 (JP08048276 Heisei) 19960208
PRAI JP 1996-48276 19960208
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1997
IC ICM **H01L021-3065**

ICS G01R027-02; **H01L021-203**; **H01L021-205**; **H01L021-66**

AB PROBLEM TO BE SOLVED: To always accurately detect the reaction state without regulation or maintenance by **detecting** a **plasma** state by **detecting** the impedance of **plasma**.
SOLUTION: Reaction gas is supplied into a reaction chamber 1 regulated to a predetermined pressure and predetermined temperature, and the power of high-frequency power source 5 is supplied between a pair of **upper** and lower **electrodes** 2 and 3. A plasma is generated between the electrodes 2 and 3, the gas is activated by the plasma, reacted with the material desired to be etched on a wafer 6, and removed together with the reaction gas. In this plasma etching **apparatus**, the reaction state, namely, the proceeding state of etching is detected by an impedance sensor 7 provided in a plasma generator between the electrodes 2 and 3.
COPYRIGHT: (C)1997,JPO

L49 ANSWER 22 OF 50 COMPENDEX COPYRIGHT 2002 EEI
AN 1998(30):3306 COMPENDEX
TI SEMATECH projects in advanced process control.
AU Bogardus, E.Hal (SEMATECH, Austin, TX, USA); Bakshi, Vivek; Gragg, John
MT Proceedings of the 1997 IEEE International Symposium on Semiconductor on Manufacturing Conference.
MO IEEE
ML San Francisco, CA, USA
MD 06 Oct 1997-08 Oct 1997
SO IEEE International Symposium on Semiconductor Manufacturing Conference, Proceedings 1997.IEEE, Piscataway, NJ, USA,97CH36023. p B25-B28
CODEN: 002876
PY 1997
MN 48448
DT Conference Article
TC General Review
LA English
AB Scatterometer measurements of critical dimensions paralleled those of atomic force microscopy down to 0.14 um.Application of a run to run controller to chemical mechanical processes demonstrated control to target for patterned wafers and improvements in CpK of 150% for epitaxial processes.Benchmarking of commercial software for fault **detection** of **plasma** etchers demonstrated feasibility in identifying faults during operation.(Author abstract) 2 Refs.
CC 731 Automatic Control Principles and Applications; 714.2 Semiconductor Devices and Integrated Circuits; 741.3 Optical Devices and Systems; 723 Computer Software, Data Handling and Applications; 802.2 Chemical Reactions; 932.3 Plasma Physics
CT *Process control; Atomic force microscopy; **Semiconductor device manufacture**; Failure analysis; Computer software; Plasma etching
ST Scatterometry; Chemical mechanical processing
ET C*K; CpK; C cp; cp; K cp

L49 ANSWER 23 OF 50 JAPIO COPYRIGHT 2002 JPO
AN 1996-306666 JAPIO
TI DRY ETCHING **DEVICE**
IN YAMANE TETSUYA
PA SONY CORP
PI JP 08306666 A 19961122 Heisei
AI JP 1995-131160 (JP07131160 Heisei) 19950502
PRAI JP 1995-131160 19950502
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1996
IC ICM **H01L021-3065**
ICS C23F004-00

AB PURPOSE: To provide a dry etching **device**, which can detect stably the end point of an etching and at the same time, can perform the etching which hardly contaminator a wafer.
CONSTITUTION: A dry etching **device** is provided with a chamber 11 for holding a plasma atmosphere, lower and **upper electrodes** 12 and 13 provided in the chamber 11, a generated plasma light extraction window 14 provided on the sidewall of the chamber 11, an end point detector 15 mounted to the outside of the window 14 and a high-frequency power supply 17 connected with the electrode 12 via a capacitor 16. A semiconductor wafer 19 is placed on the electrode 12. The window 14 is constituted of a high-purity aluminum oxide (Al<SB>2</SB>O<SB>3</SB>), which is one of light-transmitting ceramics, and transmits efficiently emitted plasma light generated in the chamber 11 to guide the **plasma** light to the **detector** 15. This window is never devitrified even if the wafer 19 is etched and as the window contains little impurities, the wafer 19 is little contaminated.

L49 ANSWER 24 OF 50 HCAPLUS COPYRIGHT 2002 ACS
AN 1996:240950 HCAPLUS
DN 124:330850
TI Optical emission studies of the Mach disk extracted from an inductively coupled plasma with an echelle spectrometer and segmented-array charge-coupled detectors
AU Luan, Shen; Pang, Ho-Ming; Houk, R. S.
CS US Dep. Energy, Iowa State Univ., Ames, IA, 50011, USA
SO Journal of Analytical Atomic Spectrometry (1996), 11(4), 247-52
CODEN: JASPE2; ISSN: 0267-9477
PB Royal Society of Chemistry
DT Journal
LA English
CC 79-2 (Inorganic Analytical Chemistry)
AB An inductively coupled plasma (ICP) is extd. into a small quartz vacuum chamber through a sampling orifice in a water-**cooled** copper **plate**. Optical emission from the spectrometer equipped with two segmented-array charge-coupled **device** detectors, the Optima 3000 from Perkin-Elmer. This **device** provides high quantum efficiency throughout the UV-visible region, as well as low dark current and readout noise. The spectral background emitted by the Mach disk is very low. Axial profiles of the optical emission of a range of atom and ion lines are measured. The effects of aerosol gas flow rate on the intensities of various lines were studied. The relation between the location of the Mach disk and the pressure in the expansion chamber is also studied. The analyte line intensities are enhanced at higher pressure.
ST ICP emission segmented array charge detector; echelle spectrometer ICP emission CCD detector
IT Spectrometers
  (at. emission, using Mach disk emission source and echelle spectrometer and segmented-array charge-coupled detectors for ICP spectrometric anal.)
IT Spectrochemical analysis
  (at. plasma emission, ICP; using Mach disk emission source and echelle spectrometer and segmented-array charge-coupled detectors)
IT 7439-95-4, Magnesium, analysis 7440-24-6, Strontium, analysis 7440-70-2, Calcium, analysis
RL: ANT (Analyte); PRP (Properties); ANST (Analytical study)
  (Mach disk emission source and echelle spectrometer and segmented-array charge-coupled **detector** in inductively coupled **plasma** at. emission spectrometry of)

L49 ANSWER 25 OF 50 INSPEC COPYRIGHT 2002 IEE
AN 1996:5382062 INSPEC DN B9611-4360-011
TI Development of the **plasma detecting** system in CO2 laser welding.
AU Wang, Y.; Chen, W.; Zhang, X.; Huang, G.; Zhang, H. (Dept. of Mech. Eng., Tsinghua Univ., Beijing, China)
SO Proceedings of the SPIE - The International Society for Optical Engineering (1996) vol.2703, p.184-91. 2 refs.
Published by: SPIE-Int. Soc. Opt. Eng
Price: CCCC 0 8194 2077 8/96/$6.00
CODEN: PSISDG ISSN: 0277-786X
SICI: 0277-786X(1996)2703L.184:DPDS;1-H
Conference: Lasers as Tools for Manufacturing of Durable Goods and Microelectronics. San Jose, CA, USA, 29 Jan-2 Feb 1996
Sponsor(s): SPIE
DT Conference Article; Journal
TC Practical; Experimental
CY United States
LA English
AB An advanced **plasma detecting** system has been developed for CO2 laser welding. The system consists of three sensors, signal processing A/D data conversion and photo-electric coupling units connected to a rapid personal computer. The photocell sensor (PS) detects the intensity of the blue light irradiated by the plasma. The **plasma** charge sensor (PCS) **detects** the electric density of the plasma plume. The microphone sensor (MS) **detects** the sound **pressure** coming from the rapidly expanding vapor in the keyhole. All of the sensors can exactly distinguish three kinds of welding processes: heat conduction welding, deep penetration welding, and unstable mode welding. When the welding parameters are given, the PCS signals depend on the distance between the welding nozzle and the workpiece, and the PS signals are correlated closely to the focal point position. Three sensors can be used to control the focal point position (penetration depth) under given laser power and welding speed. In addition, the relationship between detecting signals and penetration depth is given. The system sensors have features such as simple structure, low cost and high sensitivity, which are especially suitable for on-line **plasma detection**, quality control and off-line plasma analysis of CO2 laser welding.
CC B4360 Laser applications; B0170L Inspection and quality control; B4320C Gas lasers; B7220 Signal processing and conditioning equipment and techniques; B4250 Photoelectric devices; B7810C Sonic and ultrasonic transducers; B7230 Sensing devices and transducers
CT ANALOGUE-DIGITAL CONVERSION; GAS LASERS; HEAT CONDUCTION; LASER BEAM WELDING; LASER MATERIALS PROCESSING; MICROCOMPUTER APPLICATIONS; MICROPHONES; PHOTOELECTRIC **DEVICES**; PLASMA DENSITY; PLASMA PRODUCTION BY LASER; QUALITY CONTROL; SENSORS
ST **plasma detecting system**; CO2 laser welding; signal processing A/D data conversion; photo-electric coupling; personal computer; photocell sensor; blue light intensity; plasma charge sensor; plasma plume electric density; microphone sensor; sound pressure; expanding keyhole vapor; heat conduction welding; deep penetration welding; unstable mode welding; welding parameters; welding nozzle; quality control; focal point position; penetration depth; off-line plasma analysis; **on-line plasma detection**; CO2
CHI CO2 bin, O2 bin, C bin, O bin
ET C*O; CO2; C cp; cp; O cp; CO; O

L49 ANSWER 26 OF 50 COMPENDEX COPYRIGHT 2002 EEI
AN 1996(45):3312 COMPENDEX

TI Role of test stress levels in detection of process-induced latent charging damage in MOS transistors.
AU Brozek, Tomasz (Univ of California at Los Angeles, CA, USA); Peng, Lihua; Viswanathan, C.R.
MT Proceedings of the 1996 1st International Symposium on Plasma Process-Induced Damage, P2ID.
MO AVS; IEEE; JSAP
ML Santa Clara, CA, USA
MD 13 May 1996-14 May 1996
SO International Symposium on Plasma Process-Induced Damage, P2ID, Proceedings 1996.IEEE, Piscataway, NJ, USA,96TH8142.p 81-83
CODEN: 002436
PY 1996
MN 45303
DT Conference Article
TC Theoretical
LA English
AB The role of stress level during constant-current Fowler-Nordheim stress test on degradation of device parameters is investigated. This effect is analyzed from the point of view of **detection** of **plasma** process-induced latent charging damage in submicron NMOS devices. It has been found that with increasing stress level the damage introduced by the test stress itself increases, mainly due to enhanced electron trap generation and interface deterioration. Under high stress levels used for assessment of charging damage, the effect of process-induced charging may be masked by the damage introduced during the test.(Author abstract) 7 Refs.
CC 714.2 Semiconductor Devices and Integrated Circuits; 932.3 Plasma Physics; 701.1 Electricity: Basic Concepts and Phenomena; 931.3 Atomic and Molecular Physics; 931.2 Physical Properties of Gases, Liquids and Solids
CT ***Semiconductor device manufacture**; Electric charge; Stress analysis; MOSFET devices; Interfaces (materials); Degradation; Electrons; Plasma applications
ST Charging damage; Stress level; Fowler-Nordheim stress test; Electron trap generation

L49 ANSWER 27 OF 50 WPIX (C) 2002 THOMSON DERWENT
AN 1995-119105 [16] WPIX
DNN N1995-093675 DNC C1995-054720
TI **Detecting plasma** discharge failure in microwave-discharge **plasma** process **appts.** - by **detecting** discharge power, **pressure**, potential or current in discharge space.
DC M13 U11
PA (CANO) CANON KK
CYC 1
PI JP 07041954 A 19950210 (199516)* 7p C23C016-50
JP 3137810 B2 20010226 (200114) 7p C23C016-511
ADT JP 07041954 A JP 1993-188387 19930729; JP 3137810 B2 JP 1993-188387 19930729
FDT JP 3137810 B2 Previous Publ. JP 07041954
PRAI JP 1993-188387 19930729
IC ICM C23C016-50; C23C016-511
ICS C23F004-00; **H01L021-205**; **H01L021-3065**; H05H001-00; H05H001-46
AB JP 07041954 A UPAB: 19950502
The discharge power, discharge pressure, discharge potential or discharge current in the discharge space of a **plasma** process equipment is **detected**. A discharge failure state is found from the detected value.

ADVANTAGE - Plasma discharge can be restarted in response to discharge failure detection.
Dwg.1/4
FS CPI EPI
FA AB; GI
MC CPI: M13-E07
EPI: U11-C01B; U11-C05C3

L49 ANSWER 28 OF 50 WPIX (C) 2002 THOMSON DERWENT
AN 1995-103301 [14] WPIX
DNN N1995-081412 DNC C1995-047590
TI Dry etching **device** improved in uniformity - comprising electrodes, detecting means and wafer in chamber which is plasma etched by HF power.
DC L03 M14 U11
PA (NIDE) NEC CORP
CYC 1
PI JP 07029887 A 19950131 (199514)* 7p H01L021-3065 <--
JP 2503893 B2 19960605 (199627) 6p H01L021-3065 <--
ADT JP 07029887 A JP 1993-171855 19930712; JP 2503893 B2 JP 1993-171855 19930712
FDT JP 2503893 B2 Previous Publ. JP 07029887
PRAI JP 1993-171855 19930712
IC ICM **H01L021-3065**
ICS C23F004-00
AB JP 07029887 A UPAB: 19970502
The **device** comprises a pair of **upper** and lower **electrodes,** a detecting means and a wafer carrying means, so that high frequency power can be applied to a pair of electrodes to give plasma etching treatment to a semiconductor wafer stored in an etching chamber.
ADVANTAGE - The surface of the wafer is improved in uniformity.
Dwg.3/10
FS CPI EPI
FA AB; GI
MC CPI: L04-C07D; M14-A02
EPI: U11-C07A1; U11-C09C

L49 ANSWER 29 OF 50 WPIX (C) 2002 THOMSON DERWENT
AN 1995-103296 [14] WPIX
DNN N1995-081407 DNC C1995-047585
TI Processing chamber monitoring **appts.** - has photoelectric converter whose output is given to waveform extraction **device** which is analysed by waveform analysis **device.**
DC L03 U11
PA (HISD) HITACHI DEVICE ENG CO LTD; (HITA) HITACHI LTD
CYC 1
PI JP 07029882 A 19950131 (199514)* 5p H01L021-3065 <--
ADT JP 07029882 A JP 1993-154827 19930625
PRAI JP 1993-154827 19930625
IC ICM **H01L021-3065**
AB JP 07029882 A UPAB: 19950412
The processing chamber monitoring **appts.** consists of a photoelectric convertor (4) to **detect** the spectrum of **plasma** (5) with an etching processing chamber (1) inside. The etching processing chamber is provided with detection window (2), a lower **electrode** (10) and an **upper electrode** (11).
The waveform of emission spectrum of the detected signal of the photo electric convertor is obtained by a waveform extraction **device** (7). A waveform analysis **device** (8) analyses the spectral characteristics of the waveform from the waveform extraction

device and judges the cleaning time of the etching processing chamber.

USE/ADVANTAGE - For use in mfg. semiconductor **device,** LCD. Cleans etching processing chamber at optimum time. Improves quality of product.

Dwg.1/4

FS CPI EPI
FA AB; GI
MC CPI: L04-C07D; L04-C18; L04-D04
EPI: U11-C07A1; U11-C09C

L49 ANSWER 30 OF 50 JAPIO COPYRIGHT 2002 JPO
AN 1994-318572 JAPIO
TI METHOD AND **APPARATUS** FOR **DETECTING** END POINT OF **PLASMA** TREATMENT
IN SAITO SUSUMU
PA TOKYO ELECTRON YAMANASHI KK
PI JP 06318572 A 19941115 Heisei
AI JP 1994-31702 (JP06031702 Heisei) 19940302
PRAI JP 1993-69204 19930304
JP 1993-69205 19930304
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1994
IC ICM **H01L021-302**
ICS C23F004-00
AB PURPOSE: To detect an end point accurately even on different plasma treatment conditions by letting a point when a ratio of a mean value and a dispersed value of a generation strength of a specified wave length of an emission spectrum within a specified period of time to a calculated value of a generation strength after the specified period of time and the said mean value and a dispersed value exceeds a specified reference value be an end point.

CONSTITUTION: This equipment is provided with a treatment chamber 11 formed of conductive material such as aluminum, a lower **electrode** 12, and an **upper electrode** 13 which is placed above and apart from the lower electrode 12. A gas lead-in pipe 14 for leading in fluorocarbon-system etching gas such as CF is connected to the upper part of the treatment chamber 11 and an exhaust pipe 15 is also connected to the treatment chamber 11. The **upper electrode** 13 is connected to a high-frequency source 16. Outside a window 17, a lens 21 for condensing transmitted light and a photo detector 22 are placed.

COPYRIGHT: (C)1994,JPO

L49 ANSWER 31 OF 50 JAPIO COPYRIGHT 2002 JPO
AN 1994-037051 JAPIO
TI PLASMA **DEVICE**
IN DEGUCHI YOICHI
PA TOKYO ELECTRON LTD
PI JP 06037051 A 19940210 Heisei
AI JP 1992-209489 (JP04209489 Heisei) 19920715
PRAI JP 1992-209489 19920715
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1994
IC ICM **H01L021-302**
AB PURPOSE: To adjust plasma density readily and to make plasma uniform by dividing an **upper electrode** which is a grounding electrode into a plurality through an insulator, by grounding them through a matching **device** respectively and by adjusting each of the matching **devices** properly.

CONSTITUTION: A treatment body 5 is first etched in a plasma **device** wherein an **upper electrode** 11 is a grounding electrode, a lower electrode 2 is a power supply electrode and

electrodes 12, 13, 14 formed by insulating and dividing the **upper electrode** 11 into a plurality are grounded through matching **devices** 34, 35, 36 which adjust surface electric potential of the electrodes respectively. In case over etching, etc., caused by irregularities of **plasma** are **detected** on analyzing results of the above, a position of over etching, etc., is defined, the matching **devices** 34, 35, 36 are adjusted and surface electric potential of each of electrodes 12, 13, 14 is adjusted. Thereby, it is possible to make plasma uniform by adjusting surface electric potential of each electrode.

L49 ANSWER 32 OF 50 HCAPLUS COPYRIGHT 2002 ACS
AN 1994:524223 HCAPLUS
DN 121:124223
TI Direct introduction of solid and powder samples into a rotating arc plasma jet
AU Mohamed, M. M.; Mossaad, M. M.; Nasra, M. K.; Nasr, F. I.; Fikry, N M.
CS Med. Res. Inst., Univ. Alexandria, Alexandria, Egypt
SO Indian Journal of Pure and Applied Physics (1994), 32(6), 471-6
CODEN: IJOPAU; ISSN: 0019-5596
DT Journal
LA English
CC 79-6 (Inorganic Analytical Chemistry)
Section cross-reference(s): 9, 73
AB A modified rotating arc plasma jet (RAPJ) for direct anal. of solid and powder samples has been presented. The arc column burns between a pointed thoriated tungsten cathode (**upper electrode**) and a cylindrical rod sample anode. Both electrodes are protected by an argon atm. Rotating arc plasma jet operates by forcing arc discharge to rotate reproducibility on the anode surface by introducing argon gas tangentially to the anode, powder samples are packed into graphite cups. An aerosol is generated from solid samples with the use of the arch discharge. Spectroscopic measurements are made in the plume above the cathode. The design of this **device** has been thoroughly examd. and each parameter affecting its anal. performance has been evaluated. Measurements reported include: sampling efficiency, effect of argon flow rate on anal. performance, plasma stability, anal. curves, and detection limits for Zn, Fe, Ca, Mg, Ba, and Pb.
ST sample solid powder introduction plasma AES; rotating arc plasma jet sample introduction
IT Bone
(bovine, direct introduction of solid samples into rotating arc plasma jet for plasma at. emission spectrometric anal. of)
IT Metals, analysis
RL: ANST (Analytical study)
(direct introduction of solid samples into rotating arc plasma jet for plasma at. emission spectrometric anal. of)
IT Spectrochemical analysis
(at. plasma emission, inductively-coupled, direct introduction of solid and powder samples into rotating arc plasma jet for)
IT Samples
(powd., direct introduction of, into rotating arc plasma jet for plasma at. emission spectrometry)
IT Samples
(solid, direct introduction of, into rotating arc plasma jet for plasma at. emission spectrometry)
IT 7439-89-6, Fe element, analysis 7439-92-1, Pb element, analysis
7439-95-4, Mg element, analysis 7440-39-3, Ba element, analysis
7440-66-6, Zn element, analysis 7440-70-2, Ca element, analysis

RL: ANT (Analyte); ANST (Analytical study)
(**detection** of, by **plasma** at. emission spectrometry,
direct introduction of solid and powder samples into rotating arc
plasma jet for)

L49 ANSWER 33 OF 50 JAPIO COPYRIGHT 2002 JPO
AN 1993-175165 JAPIO
TI PLASMA **DEVICE**
IN SENOO KOJI
PA KAWASAKI STEEL CORP
PI JP 05175165 A 19930713 Heisei
AI JP 1991-342767 (JP03342767 Heisei) 19911225
PRAI JP 1991-342767 19911225
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1993
IC ICM **H01L021-302**
ICS **H01L021-205; H01L021-31**
AB PURPOSE: To highly accurately monitor the thickness of a film in real time by measuring the emission spectrum or mass spectrum of a prescribed atom or molecule contained in a **plasma** gas and **detecting** that the integrated value of the spectrum reaches a prescribed value.
CONSTITUTION: In order to form, for example, a silicon nitride film on a semiconductor wafer 3, a mixed gas of SiH<SB>4</SB> and N<SB>2</SB>O is introduced into a vacuum vessel 14 and plasma is generated by applying a high-frequency voltage across an **upper** and lower **electrodes** 1 and 2. The light 12 emitted from the generated plasma is separated by means of a spectroscope 10 and only the light in a 414-nm peak wavelength region corresponding to the SiH is received and light receiving signals are integrated by means of an integrator 11. When the integrated value reaches the value corresponding to the prescribed film thickness, the power supply to the electrodes 1 and 2 from a high-frequency power source 13 is stopped. Of course, it is also possible to provide an mass spectrometer and detect the integrated value of the amount of a specific atom or molecule in the same way. Therefore, the thickness of a deposited film or etched thickness of a film can be monitored with high accuracy in real time.
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L49 ANSWER 34 OF 50 WPIX (C) 2002 THOMSON DERWENT
AN 1993-030248 [04] WPIX
DNN N1993-096623 DNC C1993-013482
TI Semiconductor **device** manufacturing **appts**. performing etching operation - has through hole not oriented vertically or horizontally, connecting material to be etched with optical end point detector.
DC U11
IN NAMOSE, I
PA (SHIH) SEIKO EPSON CORP
CYC 2
PI JP 04355917 A 19921209 (199304)* 4p H01L021-302 <--
US 5200016 A 19930406 (199316)B 5p H01L021-00 <--
US 5332464 A 19940726 (199429) 5p H01L021-00 <--
ADT JP 04355917 A JP 1991-247302 19910926; US 5200016 A US 1991-774850 19911011; US 5332464 A Div ex US 1991-774850 19911011, US 1993-10167 19930128
FDT US 5332464 A Div ex US 5200016
PRAI JP 1990-273623 19901012
IC ICM **H01L021-00; H01L021-302**
AB JP 04355917 A UPAB: 19981001
Dwg.1/4
FS EPI

FA AB; GI
MC CPI: L04-C07; L04-C13A
EPI: U11-C07A2; U11-C07D1; U11-C07D4; U11-C07A1; U11-C09C

L49 ANSWER 35 OF 50 JAPIO COPYRIGHT 2002 JPO
AN 1992-333230 JAPIO
TI ETCHING TERMINATION **DETECTOR** IN **PLASMA** ETCHING **DEVICE**
IN SAKAKURA KATSURA
PA KOKUSAI ELECTRIC CO LTD
PI JP 04333230 A 19921120 Heisei
AI JP 1991-131942 (JP03131942 Heisei) 19910508
PRAI JP 1991-131942 19910508
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1992
IC ICM **H01L021-302**
AB PURPOSE: To enable the title detector to detect the etching termination constantly in the best condition even in the case of plasma fluctuation or in the case of the modification of the gaps between **upper** and lower **electrodes** within the title plasma etching **device** .

CONSTITUTION: Within the title etching termination **detector** of a **plasma** etching **device** etching a wafer 5 held by either one electrode out of opposing two electrodes 2, 3 whereon high-frequency power is impressed to produce plasma after feeding a reactive gas, a bar type quartz glass 19 passing through either one out of said electrodes 2, 3 is provided. Next, an optical fiber 21 is connected to said quartz fiber 19 to **detect** the **plasma** beams for **detecting** the etching termination by the fluctuation in the plasma beams on the other hand, when said quartz glass 19 is rod type, a guide tube 12 encircling said quartz glass 19 is provided to feed the reactive gas from the peripheral parts of the quartz glass 19 while when said quartz glass 19 is made of a tube, the reactive gas is to be fed from the hollow part of the quartz glass 19.
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L49 ANSWER 36 OF 50 HCAPLUS COPYRIGHT 2002 ACS
AN 1992:439516 HCAPLUS
DN 117:39516
TI Characterization of a low-pressure microvolume **plasma** emission **detector** for gas chromatography
AU Klemp, Mark; Puig, Lourdes; Trivedi, Ketan; Sacks, Richard
CS Dep. Chem., Univ. Michigan, Ann Arbor, MI, 48109, USA
SO Journal of Chromatographic Science (1992), 30(4), 136-41
CODEN: JCHSBZ; ISSN: 0021-9665
DT Journal
LA English
CC 80-2 (Organic Analytical Chemistry)
Section cross-reference(s): 73
AB A hollow-cathode glow discharge **device** for element-selective gas chromatog. detection is evaluated. The **device** is used with a vacuum-outlet GC for the **plasma** emission **detection** of some nonmetallic elements. The GC column passes directly into the hollow cathode cavity. The cavity vol. is about 10 .mu.L. The **device** is operated in a pressure range of about 10 to 100 torr with plasma currents from 15 to 150 mA. Polymer formation occurs in the cathode cavity during passage of large quantities of solvent. Strategies for controlling these processes are discussed. When used for high speed GC detection, some tailing is obsd., particularly for fluorinated compds. The effects of electrode geometry, plasma current, and plasma pressure on relative emission intensities and detector band shapes are described for

the element selective detection of F-contg. compds.
ST low **pressure** emission **detector** gas chromatog; microvol **plasma** emission **detector** gas chromatog; fluorine org compd detector gas chromatog
IT Chromatographs, gas
(**detectors**, spectrometric, low-**pressure** microvol. plasma emission)
IT 7782-41-4D, Fluorine, org. compds.
RL: ANT (Analyte); ANST (Analytical study)
(**detection** of, low-**pressure** microvol. **plasma** emission **detector** for gas chromatog.)

L49 ANSWER 37 OF 50 WPIX (C) 2002 THOMSON DERWENT
AN 1991-278649 [38] WPIX
DNN N1991-212731 DNC C1991-121054
TI **Device** for controlled plasma treatment of semiconductor wafer - etches wafer between pair of electrodes, applies HF waves in low **pressure** atmos. and **detects plasma** by electrostatic probe.
DC L03 U11
PA (HITA) HITACHI LTD; (HITA-N) HITACHI TOKYO ELTRN KK
CYC 1
PI JP 03185825 A 19910813 (199138)*
ADT JP 03185825 A JP 1989-323744 19891215
PRAI JP 1989-323744 19891215
IC C23F004-00; **H01L021-30**
AB JP 03185825 A UPAB: 19930928
In a **device** for etching wafer of semiconductor located between a pair of electrodes by applying high frequency wave power to the electrodes which are arranged in atmos. of low pressure reaction gas, electrostatic probe is arranged in the atmos. for **detecting** amt. of the **plasma**.
ADVANTAGE - Condition of plasma can be grasped in real time to enable control of the plasma, and high frequency wave power and flow rate of gas can be controlled.
1/8
FS CPI EPI
FA AB; GI
MC CPI: L04-C07D; L04-D04
EPI: U11-C09C

L49 ANSWER 38 OF 50 JAPIO COPYRIGHT 2002 JPO
AN 1991-285087 JAPIO
TI DRY ETCHING **DEVICE**
IN KAWAZU YOSHIYUKI; JINBO HIDEYUKI; OTA TSUNEAKI; YAMASHITA YOSHIO
PA OKI ELECTRIC IND CO LTD
PI JP 03285087 A 19911216 Heisei
AI JP 1990-86489 (JP02086489 Heisei) 19900330
PRAI JP 1990-86489 19900330
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1991
IC ICM C23F004-00
ICS **H01L021-302**
AB PURPOSE: To obtain the **device** transmissible to plasma emission and capable of detecting the etching end point with high precision by providing a heating medium to an etching chamber transmissible to plasma emission or to an emission takeoff part transmissible to plasma emission.
CONSTITUTION: A sample 5 placed on a lower electrode 3 is etched in the etching **device** 11. In this case, a gaseous etchant E is supplied 19 to hold the etching chamber 12 at a specified pressure. A high-frequency power is impressed on the **upper** and lower

electrodes 2 and 3 to convert the etchant E between the electrodes 2 and 3 to plasma, and the sample 5 is etched. The plasma emission L generated from the **plasma** P is **detected** by an end point detector 70 during the etching to detect the etching end point. The heating medium 18 is brought into contact with the emission takeoff part 13 to heat the takeoff part 13 during the etching. Consequently, the polymer incorporated in the etchant E and the reaction product are not sublimated or deposited on the surface of the takeoff part 13. Accordingly, the transmissivity to the plasma emission L is maintained, and the etching end point is detected with high precision.

L49 ANSWER 39 OF 50 COMPENDEX COPYRIGHT 2002 EEI
AN 1991(11):140996 COMPENDEX DN 9111143898
TI Applications of optical emission spectroscopy in plasma manufacturing systems.
AU Gifford, George G. (IBM East Fishkill Facility, Hopewell Junction, NY, USA)
MT Advanced Techniques for Integrated Circuit Processing.
MO SPIE
ML Santa Clara, CA, USA
MD 01 Oct 1990-05 Oct 1990
SO Proceedings of SPIE - The International Society for Optical Engineering v 1392.Publ by Int Soc for Optical Engineering, Bellingham, WA, USA.p 454-465
CODEN: PSISDG ISSN: 0277-786X
PY 1991
MN 14635
DT Conference Article
TC Application; Experimental
LA English
AB Optical emission spectroscopy (OES) is an established laboratory diagnostic technique for **plasma** processes.By **detecting** light from the electronic transitions of atoms and molecules it is possible to identify and monitor the chemical species in a plasma.This technique has been extended to semiconductor manufacturing to determine the endpoint of plasma processes.The production of semiconductor devices relies heavily on plasma etching and deposition processes.Because OES is a fairly simple technique, its use as a continuous tool and process monitor has been investigated.Ultimately, this technique could provide immediate feedback for automatic adjustment of individual process parameters.This embodiment has been referred to as adaptive process control.(Author abstract)
CC 741 Optics & Optical Devices; 932 High Energy, Nuclear & Plasma Physics; 714 Electronic Components; 732 Control Devices
CT *SPECTROSCOPY, EMISSION:Applications; PLASMAS:Diagnostics; ETCHING; **SEMICONDUCTOR DEVICE MANUFACTURE**; PROCESS CONTROL
ST PLASMA MANUFACTURING SYSTEMS; OPTICAL EMISSION SPECTROSCOPY

L49 ANSWER 40 OF 50 HCAPLUS COPYRIGHT 2002 ACS
AN 1991:93440 HCAPLUS
DN 114:93440
TI Treatment **apparatus** for semiconductor substrates
IN Miyagawa, Yasuharu
PA Oki Electric Industry Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 7 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01L021-302

ICS H01L021-31
CC 76-3 (Electric Phenomena)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 02224242	A2	19900906	JP 1989-260502	19891005
PRAI	JP 1988-294114		19881121		

AB The **app.** has optical detector(s) for detection of states of a polymer or a film formed in the chamber and evaluation of the state in respect to the allowable ranges thereof based on the output from the detector(s). A reflection light from an **upper electrode** was **detected** in **plasma** etching of a SiO2 on a substrate which was placed on a lower electrode, the thickness and n of a polymer film formed on the **upper electrode** from an etching gas mixt. of C2F6-CHF3 was detected, and the necessity of cleaning of the chamber wall was evaluated.
ST chamber wall deposition optical evaluation; silica film plasma etching; chem vapor deposition **app** semiconductor substrate; plasma etching **app** semiconductor substrate; semiconductor treatment **app**
IT Films
(chem. vapor deposition **app.** for, on semiconductor substrates, optical evaluation of chamber wall deposition for)
IT Fluoropolymers
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(optical evaluation of wall deposition of, from etchant gas in plasma etching of silica films)
IT Semiconductor materials
(treatment **app.** for)
IT Etching
(**app.**, plasma, on semiconductor substrates, optical evaluation of chamber wall deposition for)
IT 7631-86-9, Silica, reactions
RL: RCT (Reactant)
(plasma etching of)

L49 ANSWER 41 OF 50 WPIX (C) 2002 THOMSON DERWENT
AN 1990-316105 [42] WPIX
DNN N1990-242307 DNC C1990-136665
TI Etching **appts.** - has process chamber for etching at reduced **pressure,** contamination **detection device,** gas **plasma** generating **device.**
DC L03 M14 U11
PA (HITA) HITACHI LTD
CYC 1
PI JP 02224232 A 19900906 (199042)*
ADT JP 02224232 A JP 1989-42975 19890227
PRAI JP 1989-42975 19890227
IC C23F004-00; **H01L021-30**
AB JP 02224232 A UPAB: 19930928
Appts. comprises a processing chamber in which samples are etched under a reduced **pressure,** a **detection device** detecting contamination level of the chamber, a gas plasma generation **device** generating gas plasma for cleaning process in the chamber, and control **device** controlling the start and stop time of plasma by emitting a signal from the contamination level detection **device.**
USE/ADVANTAGE - The equipment can reduce foreign material stuck on the sample in the etching process and can improve the yield ratio.

1/2
FS CPI EPI
FA AB; GI
MC CPI: L04-D04; M14-A02
EPI: U11-C07A1; U11-C09C

L49 ANSWER 42 OF 50 JAPIO COPYRIGHT 2002 JPO
AN 1988-012139 JAPIO
TI DRY ETCHING **APPARATUS**
IN SUDO KOJI; TSUBOUCHI JIRO
PA MITSUBISHI ELECTRIC CORP
PI JP 63012139 A 19880119 Showa
AI JP 1986-156547 (JP61156547 Showa) 19860702
PRAI JP 1986-156547 19860702
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1988
IC ICM **H01L021-302**
AB PURPOSE: To ensure the detection of a finish point, in an etching **apparatus**, in which the finish point of etching is detected by sensors, by scanning the entire surfaces of wafers by using a plurality of sensors, and detecting the finish point.
CONSTITUTION: Wafers 1a∼1h are set on a lower electrode 3 in a chamber 6. After etching gas is introduced, high-frequency power is applied between an **upper electrode** and the lower electrode, and plasma etching is started. Sensors 5a∼5d scan all parts of the inside of the chamber 6 and wafers 1a∼1h. Light emitting intensity of Al in emission spectrum in **plasma** 4 is **detected** and applied to a finishpoint detecting unit 7. The finish-point detecting unit 7 detects the finish point of etching based on the change in light emitting intensity of Al. At this time, since a plurality of the sensors are used, the emission spectrum at each wafer position can be obtained even if the wafer is located at any position in the chamber. Therefore, the detection of the finish points of all the wafers can be ensured.

L49 ANSWER 43 OF 50 HCAPLUS COPYRIGHT 2002 ACS
AN 1989:469197 HCAPLUS
DN 111:69197
TI Detection of metastable particles with a metal-insulator-metal system
AU Jankuj, J.; Sodomka, L.; Talsky, A.; Kratochvil, J.
CS Brno, 611 37, Czech.
SO Folia Fac. Sci. Nat. Univ. Purkynianae Brun., Phys. (1988), 46(Vysokofrekvencni Vyboje Plazmochem. Reakce), 53-64
CODEN: FFSPER; ISSN: 0323-0287
DT Journal
LA Czech
CC 76-11 (Electric Phenomena)
Section cross-reference(s): 65
AB A method was developed for the **detection** of metastable **plasma** particles based on the changes in the elec. current-voltage characteristics of a metal-insulator-metal structure interacting with the plasma. The interactions of the 21S0 and 23S1 and of the Ne 33P2 and 33P0 states with the Al-Al2O3-Al system with Al **top electrode** and Al2O3 insulator thickness of 5-25 and 13-25 nm, resp., were studied. The sensitivity of the system decreases with increasing Al2O3 thickness and increased with increasing energy of metastable particles. The effect of water vapor on the elec. characteristics of the structures is obsd.
ST **plasma** metastable particle **detector** aluminum alumina; helium metastable particle detector; neon metastable particle detector
IT Electric capacitors
(aluminum-alumina-aluminum, for metastable state detection in plasmas)

IT Plasma
(metastable state in, aluminum-alumina-aluminum capacitor for)
IT Energy level
(metastable, in plasmas, aluminum-alumina-aluminum structure for study of)
IT 1344-28-1, Aluminum oxide (Al2O3), uses and miscellaneous 7429-90-5, Aluminum, uses and miscellaneous
RL: USES (Uses)
(metastable state **detection** in **plasma** with semiconductor **device** from)
IT 7440-01-9, Neon, properties 7440-59-7, Helium, properties
RL: PRP (Properties)
(**plasma**, metastable state **detection** in)

L49 ANSWER 44 OF 50 JAPIO COPYRIGHT 2002 JPO
AN 1984-040534 JAPIO
TI PLASMA ETCHING **DEVICE**
IN AIUCHI SUSUMU; OTSUBO TORU
PA HITACHI LTD
PI JP 59040534 A 19840306 Showa
AI JP 1982-149306 (JP57149306 Showa) 19820830
PRAI JP 1982-149306 19820830
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1984
IC ICM **H01L021-302**
AB PURPOSE: To enhance **detection** accuracy of the **plasma** etching finishing point by a method wherein a detection light path for light collection is provided at the center of an **upper electrode**, light emission on the whole wafers are collected, and the radiation spectral signal of a favorable SN ratio is obtained.
CONSTITUTION: Light of the emitting parts 16 of the materials 9 to be etched in plasma between parallel plate electrodes 18, 7 is led to a spectroscopic analyzer 14 through a glass cylinder 19, a pyramidal mirror 20, a lens 21, and an optical fiber 22. According to this construction, when the substrates 9 of the plural number are to be etched by plasma at the same time, lights on the whole substrates are condensed effectively to enhance efficiency, and the SN ratio of the detected signal of the spectroscopic analyzer can be enhanced by that much. Accordingly, detection precision of the etching finishing point can be enhanced sharply, and yield can be enhanced.

L49 ANSWER 45 OF 50 JAPIO COPYRIGHT 2002 JPO
AN 1984-023519 JAPIO
TI MONITORING **APPARATUS** FOR ETCHING
IN HIROBE YOSHIMICHI
PA HITACHI LTD
PI JP 59023519 A 19840207 Showa
AI JP 1982-131955 (JP57131955 Showa) 19820730
PRAI JP 1982-131955 19820730
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1984
IC ICM **H01L021-302**
AB PURPOSE: To **detect** end of **plasma** etching automatically at high accuracy, by a method wherein when films of different quality in plural layers are subjected to plasma etching, photoelectric conversion elements to convert luminous spectrum of different wavelength from plasma into electric signal and a feedback circuit to feed back the electric signal to the element are provided.
CONSTITUTION: Spectrophotoelectric conversion elements 13A and 13B to perform spectroscopic processing to only specific wave length inherent to the etching film of an SiO<SB>2</SB>, SiO<SB>3</SB>O<SB>4</SB> or the like

and to convert it into electric signal are attached to a side wall of a reaction chamber 1. These elements are connected through amplifiers 14A and 14B to a monitoring control **device** 15, which is connected to a control **device** 8 for a high-frequency oscillator and also to the elements 13A and 13B through a feedback circuit 16. Within the reaction chamber 1 in such constitution, an **upper electrode** 2 and a lower electrode 3 to hold an etching spectrum 6 thereon are opposed and luminous spectrum 12 produced between the electrodes by the high-frequency oscillator is detected by the elements 13A and 13B and the monitoring is performed.

L49 ANSWER 46 OF 50 COMPENDEX COPYRIGHT 2002 EEI
AN 1984(1):17217 COMPENDEX
TI PICOSECOND TIME-RESOLVED **DETECTION** OF **PLASMA** FORMATION AND PHASE TRANSITIONS IN SILICON.
AU Liu, J.M. (Harvard Univ, Div of Applied Sciences, Cambridge, Mass, USA); Kurz, H.; Bloembergen, N.
MT Laser-Solid Interactions and Transient Thermal Processing of Materials.
MO Materials Research Soc, USA; Office of Naval Research, Washington, DC, USA; Defense Advanced Research Projects Agency, USA; US DOE, Office of Basic Energy Sciences, Washington, DC, USA; US Army Research Office, Electronics Div, USA
ML Boston, Mass, USA
MD 01 Nov 1982-04 Nov 1982
SO Materials Research Society Symposia Proceedings v 13.Publ by North Holland, New York, NY, USA and Amsterdam, Neth p 3-12
CODEN: MRSPDH ISSN: 0272-9172
ISBN: 0-444-00788-1
PY 1983
MN 03299
DT Conference Article
LA English
AB No abstract available
CC 714 Electronic Components; 744 Lasers
CT ***SEMICONDUCTOR DEVICE MANUFACTURE:Laser Applications**
ST PLASMA FORMATION; PHASE TRANSITIONS; SILICON WAFERS; PICOSECOND PULSES; ULTRAVIOLET PULSES; GREEN PULSES; ENERGY TRANSFER

L49 ANSWER 47 OF 50 COMPENDEX COPYRIGHT 2002 EEI
AN 1980(7):1458 COMPENDEX DN 800755234
TI LINEWIDTH CONTROL IN ANISOTROPIC PLASMA ETCHING OF POLYCRYSTALLINE SILICON.
AU Mayer, T.M. (Bell Lab, Murray Hill, NJ); McConville, J.H.
SO Int Electron Devices Meet, 25th, Tech Dig, Washington, DC, Dec 3-5 1979 Publ by IEEE (Cat n 79CH1504-OED), New York, NY 1979 p 44-46
PY 1979
LA English
AB Linewidth control in anisotropic plasma etching of polycrystalline silicon using CF3Cl and CF3Cl/C2F6 gas mixtures was investigated. Experiments were performed in a radial flow **plasma** etcher utilizing endpoint **detection** consisting of RF power or **electrode** d.c. bias monitoring. Etch rate, selectivity of etching polysilicon over SiO2 and the amount of mask undercutting were all observed to be functions of the gas composition with pure CF3Cl giving the highest values for each. Lateral etching or mask undercutting was found to accelerate at the endpoint for all compositions, and was more severe for rich CF3Cl mixtures. Etching characteristics and etched polysilicon wall profiles suggest an etching mechanism dominated by surface diffusion of free Cl atoms with the Cl concentration and lifetime moderated by etching reaction

and recombination reactions with CF3. 5 refs.
CC 714 Electronic Components
CT ***SEMICONDUCTOR DEVICE MANUFACTURE**:Etching
ET C*Cl*F; CF3Cl; C cp; cp; F cp; Cl cp; C*F; C2F6; O*Si; SiO2; Si cp; O cp; Cl; CF3

L49 ANSWER 48 OF 50 INSPEC COPYRIGHT 2002 IEE
AN 1975:743178 INSPEC DN A75020117; B75011692
TI Microparticle detector based on the energy gap disappearance of semiconductors (Se, I, Te, Bi, Ge, Sn, Si, and InSb) at high pressure.
AU Rauser, P. (Max Planck Inst., Nuclear Phys., Heidelberg, West Germany)
SO Journal of Applied Physics (Nov. 1974) vol.45, no.11, p.4869-71. 2 refs.
CODEN: JAPIAU ISSN: 0021-8979
DT Journal
TC Practical
CY United States
LA English
AB The paper describes the fabrication of microparticle detectors which incorporate evaporated layers of Se. The **devices** are insensitive to vibration, mechanical shock, and radioactive emanations. Their performance has been tested using a 2 MV dust-particle accelerator, and it is shown that when used in conjunction with **plasma detectors,** such **pressure** sensitive **devices** can provide an excellent mass and velocity analysis of impacting microparticles. The **device** has applications in high pressure techniques and on space missions.
CC A0670D Sensing and detecting devices; A0735 High pressure production and techniques; A0790 Other topics in specialised instrumentation; A9480 Instrumentation and techniques for aeronomy and cosmic ray studies; B2560Z Other semiconductor devices; B7600 Aerospace facilities and techniques
CT AEROSPACE INSTRUMENTATION; DUST; HIGH-PRESSURE TECHNIQUES; PARTICLE DETECTORS; PARTICLE VELOCITY ANALYSIS; SEMICONDUCTOR **DEVICES**
ST mass analysis; dust particles; microparticle detector; energy gap disappearance; Se; I; Te; Bi; Ge; Sn; Si; InSb; fabrication; **pressure sensitive devices**; velocity analysis; high pressure techniques; space missions
ET Se; I; Te; Bi; Ge; Sn; Si; In*Sb; In sy 2; sy 2; Sb sy 2; InSb; In cp; cp; Sb cp

L49 ANSWER 49 OF 50 JAPIO COPYRIGHT 2002 JPO
AN 2002-043276 JAPIO
TI PLASMA ETCHING **DEVICE**
IN SAWAYAMA TAKAYOSHI
PA MIYAZAKI OKI ELECTRIC CO LTD
OKI ELECTRIC IND CO LTD
PI JP 2002043276 A 20020208 Heisei
AI JP 2000-225686 (JP2000225686 Heisei) 20000726
PRAI JP 2000-225686 20000726
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 2002
IC ICM **H01L021-3065**
AB PROBLEM TO BE SOLVED: To solve a problem that plasma creeps to the rear side of a gas introduction plate (the side of a **cooling plate**) from an etching chamber through gas holes when the gas holes at the gas introduction plate in a plasma etching **device** become equal to or larger than a certain size.
SOLUTION: An **upper electrode** consists of the **cooling plate** provided with a plurality of gas feeding holes for feeding gas, the gas introduction plate provided with the gas holes for introducing the gas uniformly to a semiconductor wafer, a jig for fixing the gas introduction **plate** to the **cooling**

plate and a sensor for **detecting plasma**. Thus,
when the gas holes at the gas introduction plate become large by
exhaustion and creeping of plasma occurs, a sensor for **detecting**
plasma works and stops the etching **device** at the time.

L49 ANSWER 50 OF 50 JAPIO COPYRIGHT 2002 JPO
AN 2001-326096 JAPIO
TI PLASMA FOCUS LIGHT SOURCE, LIGHTING **DEVICE**, X-RAY EXPOSURE
EQUIPMENT USING THE SAME, AND MANUFACTURING METHOD OF SEMICONDUCTOR
DEVICE
IN SUGIZAKI KATSUMI; KOMATSUDA HIDEKI; ISHIYAMA WAKANA
PA NIKON CORP
PI JP 2001326096 A 20011122 Heisei
AI JP 2000-142861 (JP2000142861 Heisei) 20000516
PRAI JP 2000-142861 20000516
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 2001
IC ICM H05G002-00
ICS G03F007-20; G21K005-00; G21K005-02; **H01L021-027**; H05H001-00
ICA G01B015-00; G01N021-73
AB PROBLEM TO BE SOLVED: To prevent an electrode of a DPE light source from
such deformation as being melted or scraped off caused by a big current
flowing for discharge, and to prevent the change of strength or location
of emission caused by **above electrode** deformation.
SOLUTION: The plasma focus light source 100 has a cathode electrode 101
and an anode electrode 102, and generates a plasma by the discharge
generated by the voltage impressed between the cathode electrode 101 and
the anode electrode 102, and generates X-ray with high brightness by
concentrating the plasma by the impression of electric field. Utilizing
the electromagnetic wave radiated from the plasma of the plasma focus
light source 100, the lighting **device** equipped with the above
plasma focus light source 100 and a reflection mirror for lighting 200
measures the state of plasma generation of the plasma focus light source
100 by an optical system of projection 301 projecting the image of
plasma, a **detector** 302 arranged at a projection surface,
and detected electromagnetic wave.